REMARKS

Claims 1-5 are pending. No amendments have been made by way of the present submission, thus, no new matter and no new issues have been raised. Additionally, in the event that the present submission does not place the application into condition for allowance, entry thereof is respectfully requested as placing the application into better form for appeal.

In view of the following remarks, Applicants respectfully request that the Examiner withdraw all rejections and allow the currently pending claims.

Issues under 35 U.S.C. §103(a)

The Examiner has rejected claims 1-5 under 35 U.S.C. §103(a) as being obvious over KR 2002084756A (KR '756) in view of Romaine et al, U.S. Patent No. 4,803,800 (Romaine '800), Kristensen et al., U.S. Patent No. 5,807,583 (Kristensen '583) and Hince, U.S. Publication No. US 2002/0090697A1 (Hince '697). Applicants respectfully traverse this rejection

I. Summary of the Present Invention

The present invention relates to a microbial material that efficiently degrades oils such as gasoline, naphtha, kerosene, bunker C oil, or toxic chemicals such as BTEX. In particular, the present invention comprises the microorganism comprising at least one selected from group consisting of Trichosporon loubieri Y1-A, Trichosporon cutaneum and white-rot fungi, degrading oil or toxic chemicals. The present invention further comprises lipophilic powder comprising at least one selected from group consisting of natural wax, synthetic wax, beeswax and waste candle as a carrier of the said microorganism. Further, the present invention also comprises microbial nutrients, such as saccharide or soybean flour.

It is important for the Examiner to note that the present invention requires lipophilic powder. The lipophilic powder of the present invention works to adsorb the oils and toxic chemicals because these all have the same lipophilic or hydrophobic properties.

However, as will become evident, when the prior art is viewed as a whole, there exists no disclosure from which those of ordinary skill in the art would be motivated to prepare the presently claimed subject matter.

Discussion of KR '756

The Examiner states that KR '756 describes the same microorganism as that of the present invention and describes using the carrier for effectively degrading the toxic chemicals. Applicants respectfully disagree with the Examiner. In fact, the carrier materials of the present invention differ from those of KR '756, and further provide an additional role in comparison with KR '756.

KR '756 discloses a novel microorganism Trichosporon loubieri Y1-A itself and method for treatment of waste water (or waste gas) using a carrier (or filter) fixed with the microorganism. The carrier material is one selected from the group consisting of polystyrene, polyurethane, polyether, polyethylene, polypropylene and plastics in particles type of diameter 0.5-5mm. The filter material is one selected from the group consisting of polyester, polyurethane, polyethylene, plastics, sand and expanded polystyrene in porous type.

In the art of the present invention, the fact that a particle type of carrier can be used for fixing and stabilizing a microorganism is known and obvious to a person having ordinary skill in the art. Generally, a carrier is a small particle of plastics like those in KR '756, sand or zeolite etc., and a microorganism is attached on the surface of carrier.

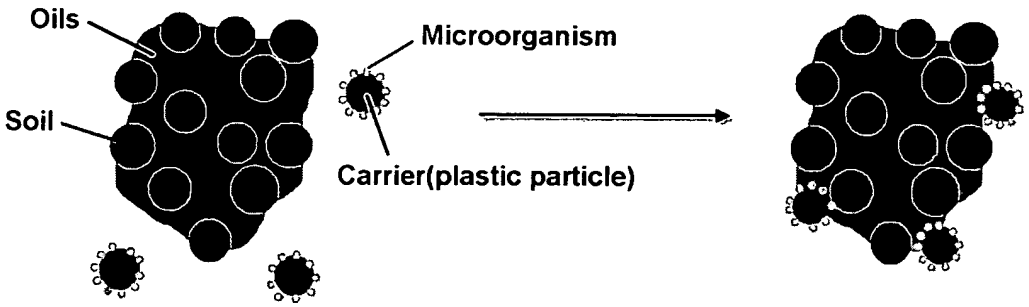
KR '756's important point is that a novel microorganism Trichosporon loubieri Y1-A degrading the oils or toxic chemicals is discovered, but not that the use of a carrier is new. In fact, KR '756 never describes a lipophilic powder (such as claimed in by the present application) as a carrier.

One of the present inventors, Dr. Yum, Kyu-Jin, also contributed to the subject matter disclosed in KR '756. Dr. Yum tried to continuously develop an efficient microbial material for degradation of oils and toxic chemicals after the time of KR '756. What was discovered was that lipophilic powder, instead of a plastic material, when used as a carrier adsorbs more oils or toxic chemicals than the carriers of KR '756 or prior known carriers such as plastics, sand and zeolites. This was apparently due to the fact that both lipophilic powder and oils (toxic chemicals) have the same lipophilic and hydrophobic properties.

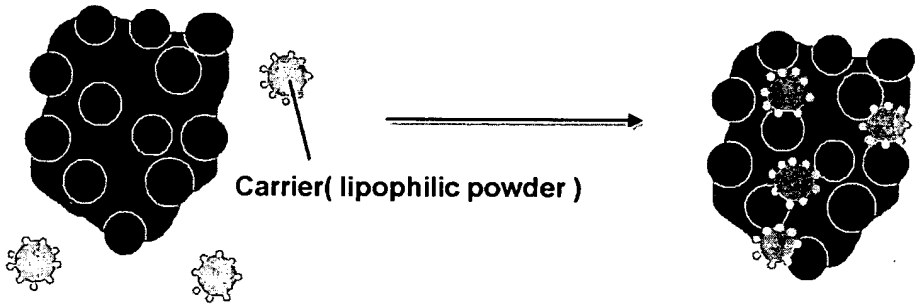
In other words, the adsorption of oils or toxic chemicals to lipophilic powder increases the contact area of the oils or toxic chemicals with the microorganism. This thereby causes the microorganism to have a higher possibility to attack and react to the oils or toxic chemicals compared to KR '756. Consequently, maximum efficiency of degradation of the oils and toxic chemicals is achieved, such as described the present specification.

The following Fig. 1 demonstrates the difference between the present invention and KR '756.

1. Fig. 1



<KR reference>



<The present invention>

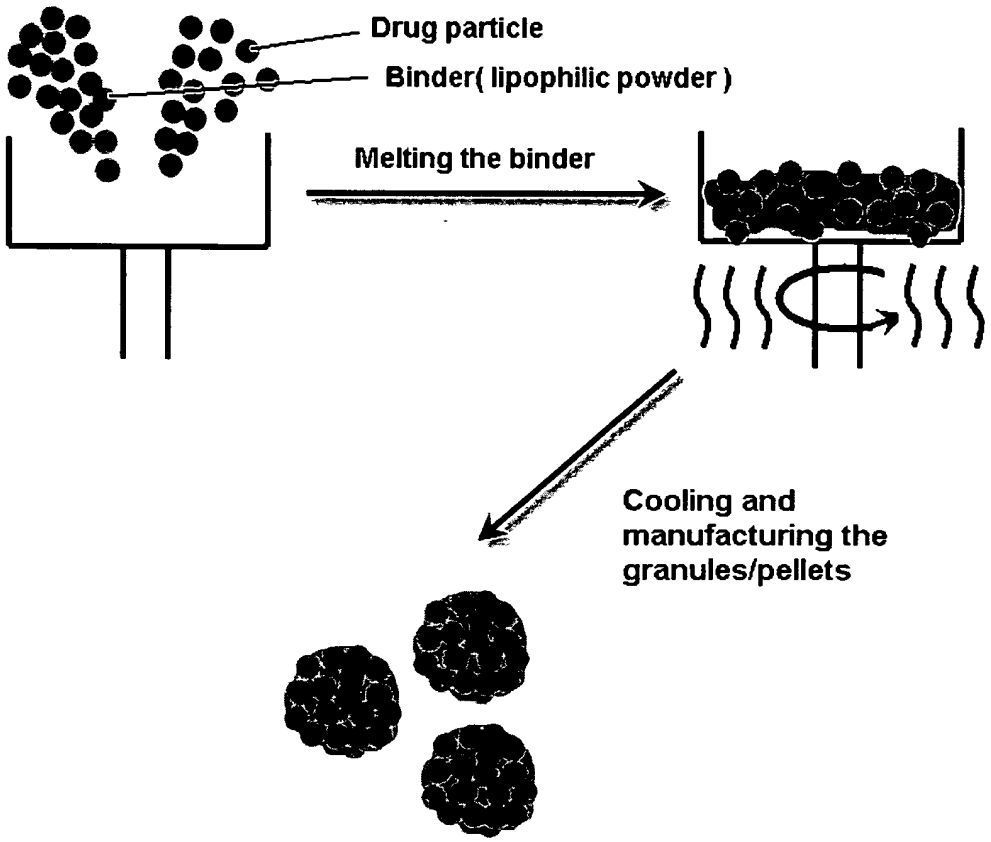
As is evident, due to the presently claimed invention, the oils and toxic chemicals are well mixed with the carrier of the present invention and adsorbed on the surface of the carrier because of its lipophilic properties.

II. Discussion of Kristensen '583

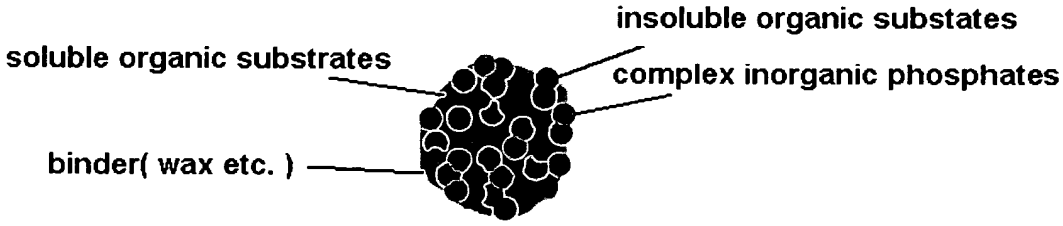
Kristensen '583 relates to preparation of sustained release pellet for pharmaceuticals. Kristensen '583 contains no disclosure concerning microorganisms or the degradation of oils. Kristensen '583 does disclose of beeswax binder. The role of lipophilic powder (i.e., beeswax) as a " binder " in Kristensen '583 combines mutually very small particle of drugs to manufacture

a granule or pellet type, and thereby, result in a sustained release effect. The process for manufacturing the granule or pellet type of pharmaceuticals comprises the steps of melting the binder (i.e. lipophilic powder such as beewax), mixing the melted binder with a drug, and cooling the mixtures. The following Fig. 2 demonstrates the process of Kristensen '583 and the role of binder.

1. Fig. 2



< Kristensen et al >



< Hince >

The binder slowly dissolves in gastric fluid, thereby drugs are separated each other. Importantly, there is no indication that the binder of Kristensen '583 is a carrier for microorganisms. The lipophilic powder (binder) in Kristensen '583 simply combines one drug particle with another drug particle. On the contrary, the lipophilic powder (carrier) of the present invention fixes the microorganism and adsorbs oils and toxic chemicals.

Accordingly, the present invention entirely differs from Kristensen '583 to the extent that one of skill in the art would never consult Kristensen '583 in the manner suggested by the Examiner.

III. Discussion of Hince '697

The Examiner has stated that the composition of Hince '697comprises powdered binders and microbial material (page 13, column 2, lines 1-9). Hince '697 relates to a slow-release solid-chemical composition comprising at least (1) soluble organic substrates, (2) substantially insoluble organic substrates and (3) complex inorganic phosphates. The composition of Hince '697 provides biologically mediated chemical reduction of organic contaminants, such as halogenated solvents, organochlorine pesticides and chlorinated hydrocarbons, inorganic contaminants, such as arsenic-based pesticides, cyanides, chromium, uranium and the oxidized form of other toxic metals, as described at page 4, column 1, lines 17-27.

In the other words, Hince '697 discloses (1) soluble organic substrates provide rapidly a electron donors into the contaminated media for anaerobic bioremediation; (2) insoluble organic substrates provide a sustained-release of electron donors over time, as described at page 4, column 2, lines 3-6. Additionally, Hince '697 discloses (3) complex inorganic phosphates

provide sources of nutrient phosphorus in forms which are enzymatically hydrolyzable by microorgarnism, as described at page 6, column 1, index No. [0044].

Hince '697 describes that additional components, such as binders, filler and pH buffers etc. may be included in the above composition, as described at page 4, column 2, index No. [0034], wherein binders, filler and pH buffers are selected from one or more of the group consisting of **waxes**, calcium carbonate, lime, limestone, siderite etc., as described page 7, column 1, index No. [0050].

Though that Hince '697 does not describe definitely the role of binder, Applicants understand that the role of binder combines together (1) soluble organic substrates, (2) substantially insoluble organic substrates and (3) complex inorganic phosphates. Applicants understand that waxes in Hince '697 are melted to have physically adhesive properties, mixed with (1) soluble organic substrates, (2) substantially insoluble organic substrates and (3) complex inorganic phosphates, and cooled at room temperature as shown the above Fig. 2.

The binder of Hince'697 never means a carrier in the context of the present invention. It does not attach the microorganism or the oils.

In the present invention, the microorganism not physically, but naturally and biologically attaches to the carrier.

Applicants cannot understand the examiner's reference to page 13, column2, lines 1-9 of Hince '697. This appears to reference claim 51 of Hince '697. In claim 51 (page 13, column 2, lines 1-9) of Hince '697, the following is described

a. powdered molasses; (described at page 4, column 2, index No.[0036])

b. powdered or granulated corn sugar, white sugar, brown sugar, and organic sugar, and any combinations thereof; (described at page 4, column 2, index No.[0036])

c. powdered or granulated milk, low-fat milk, and any combinations thereof; (described at page 4, column 2, index No.[0036])

d. sodium carboxymethyl cellulose(described at page 5, column 2, index No.[0040]) are (1) soluble organic substrates;

e. sodium formate; (described at page 5, column 1, index No.[0039])

f. cellulose powder; (described at page 6, column 1, index No.[0042])

g. powdered grain starch; (described at page 6, column 1, index No.[0042]) are (2)substantially insoluble organic substrates

h. alfalfa meal; (described at claim 15);

i. sodium hexametaphosphate, sodium trimetaphosphate, and any combinations thereof (described at page 6, column 1, index No.[0044]) are nitrogen source or (3) complex inorganic phosphates

j. magnesium stearate (described at page 7, column 1, index No.[0052]) is a source of lubricants and glidants.

k. organic polymer and plant-material degrading enzymes;

l. inoculum for microorganisms which produce organic polymer and plant-material degrading enzymes.

The Examiner is requested to recognize that the powder at page 13, column 2, lines 1-9 of Hince '697 refers to organic substrates as electron donor, not a binder.

Waxes in Hince '697 are only described at claim 24 and page 7, column 1, index No.[0050] as a source of binder.

Also, the present invention's lipophilic powder has no concern with sustained release because it is inert to the microorganism of the present invention and insoluble material.

Accordingly, the binder of Hince '697 is entirely different from the carrier of the present invention.

IV. Discussion of Romaine '800

Romaine '800 relates to a process for cultivating filamentous fungi, particular mycelium of mushroom. On the contrary, the present invention relates to degradation of the oils or toxic chemicals. Romaine '800 fail to describe that waxes have lipophilic properties or carrier properties. Rather, the waxes in Romaine '800 are only nutrient for cultivating filamentous fungi, not formation of a matrix. It is the gel matrix that fixes the microorganism in Romaine '800, and said gel matrix is listed in Table A.

The nutrient medium is penetrated within gel matrix. However, the nutrient medium is not a binder. In this regard the Examiner is respectfully requested to refer to column 4, lines 19-24 of Romaine '800 stating "[t]he substrate of the present invention is comprised of a nutrient medium capable of sustaining growth of filamentous fungi in a hydrated hydrogel matrix capsule. The capsule should be capable of supporting growth of filamentous fungi on substantially its entire surface."

Further, the Examiner is requested to refer to column 4, lines 59-column 5, lines 5 of Romaine '800 stating "the nutrient reserve may be included in any of the various media, hydrated

hydrogels (i.e., hydrophilic gel agent in the presence of water) or polymers, which provide an appropriate matrix, hereinafter termed "gel". Thus, the nutrient medium may be said to be included in a "gel matrix" (or a "hydrated hydrogel matrix" where the gel agent is a hydrated hydrogel). In general, the gel matrix used in the present invention should provide a surface onto which filamentous fungi may grow on substantially the entire capsule surface."

Further, please see column 9, lines 31-46 of Romaine '800, which states "[t]he nutrient reserve contained within the gel matrix must, of course, provide nourishment for the growth and development of the fungus. Suitable nutrients include, but are not limited to, monosaccharides, oligosaccharides, polysaccharides, ... waxes, ..."

Also, see claim 2, 24, 51, 71 and 93 of Romaine '800 refer to "said nutrient is selected from a group consisting of monosaccharides, oligosaccharides, polysaccharides, ... waxes, ..."

In contrast, the present invention relates to degradation of the oils or toxic chemicals. One important point of the present invention is the use of lipophilic powder, which easily absorbs the oils or toxic chemicals. The said lipophilic powder is not a nutrient for microorganism but rather a carrier.

Waxes in Romaine '800 do not bind to the contaminant such as the oils. Accordingly, the present invention is entirely differ from Romaine '800 in the role and function of the wax(es).

V. Summary

It is evident that deficiencies exist with respect to the primary reference of KR '756. Moreover, since the purpose of KR '756 is to provide a carrier for fixing the disclosed microorganism, and since the purpose of the present invention is to increase the efficiency for degrading oils and toxic chemicals, even if one of ordinary skill in the art were looking to

improve the invention of KR '756, they would not look to the secondary references of Romaine '800, Kristensen '583 and Hince '697. For instance, Romaine '800 is only interested in providing a nutrient for a synthetic mixture of fungi and Kristensen '583 and Hince '697 relate to sustained or slow release compositions. Accordingly, there exists no *prima facie* case of obviousness.

In view of the above, Applicants respectfully submit that the present claims define allowable subject matter. Accordingly, the Examiner is respectfully requested to withdraw all rejections and allow the currently pending claims.

If the Examiner has any questions or comments, please contact Craig A. McRobbie, Registration No 42,874 at the offices of Birch, Stewart, Kolasch & Birch, LLP.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to our Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under § 1.17; particularly, extension of time fees.

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Respectfully submitted,

By #42,874

Joseph A. Kolasch
Registration No.: 22,463
BIRCH, STEWART, KOLASCH & BIRCH, LLP
8110 Gatehouse Road
Suite 100 East
P.O. Box 747
Falls Church, Virginia 22040-0747
(703) 205-8000
Attorney for Applicant